euro teknika GROUP

SIMPLIFIED GUIDED SURGERY

User's guide

INTRODUCTION

euroteknika is the result of 20 years of clinical applications and 24 years of research and development confi rmed by valuable help of international research laboratories.
The design of our implants is based on the skills of our teams wich are both reactive and experienced in implantology:

- **Technical and biomechanical skills** of our engineers enabling to guarantee the resistance of the component and their adaptation to the oral environment thanks to modern means of simulation.

- **Biological and physiological skills** of the associated laboratories enabling to validate the capacity of osseointegration of our systems.

- **Clinical and practical skills** of our dentists advisers ensuring the ergonomics of our products, the confi rmation of our protocols and the ranges adapted to the various clinical cases.

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Warning

Guided Surgery is a very specific treatment concept, which demands experience of “classic” dental implant technology as well as a dual learning process:

- Computer assisted implant planning is a revolutionary tool but for many practitioners it means acquiring new computer skills. Do not hesitate to contact our team led by a dental surgeon and our engineers who are always contactable (during office hours) to help you use the **teknika3D** software and planning for your case. Our advisers are also available in the field, to help you master the kits and protocols in the surgical guide.

- The coordination between you and your team of assistants must be perfect. And the special organization that goes along with this system can be the source of major per-operative stress for a new user. You need to train your team and offload to them as many tasks as possible during your interventions so you can concentrate on your main objectives.

The surgeon’s experience is paramount as he is the one who needs to take things in hand when events do not happen as anticipated.

The implant planning, the instructions and protocols described here must be implemented in full using the components and instruments provided by euroteknika. These instructions will help you roll out the various phases to be implemented to carry out your implant treatments. They are accompanied by the most precise advice available, but must not be seen as “recipes”, as every clinical case in different. A very large number of factors act independently to achieve a successful implant. It is the practitioner’s responsibility to understand the key principles and to apply his/her clinical experience.

Although the methods described by **euroteknika** group may establish a treatment plan, the practitioner remains solely responsible for the medical plan of the various choices and decisions in terms of implant planning, feasibility of the treatment, the implants themselves, prosthetics and materials used, etc.

The technical specifications and clinical advice in this manual are purely indicative for the purpose of assistance and cannot be used as grounds for any complaint. All the most important information is in the notice provided with the products.

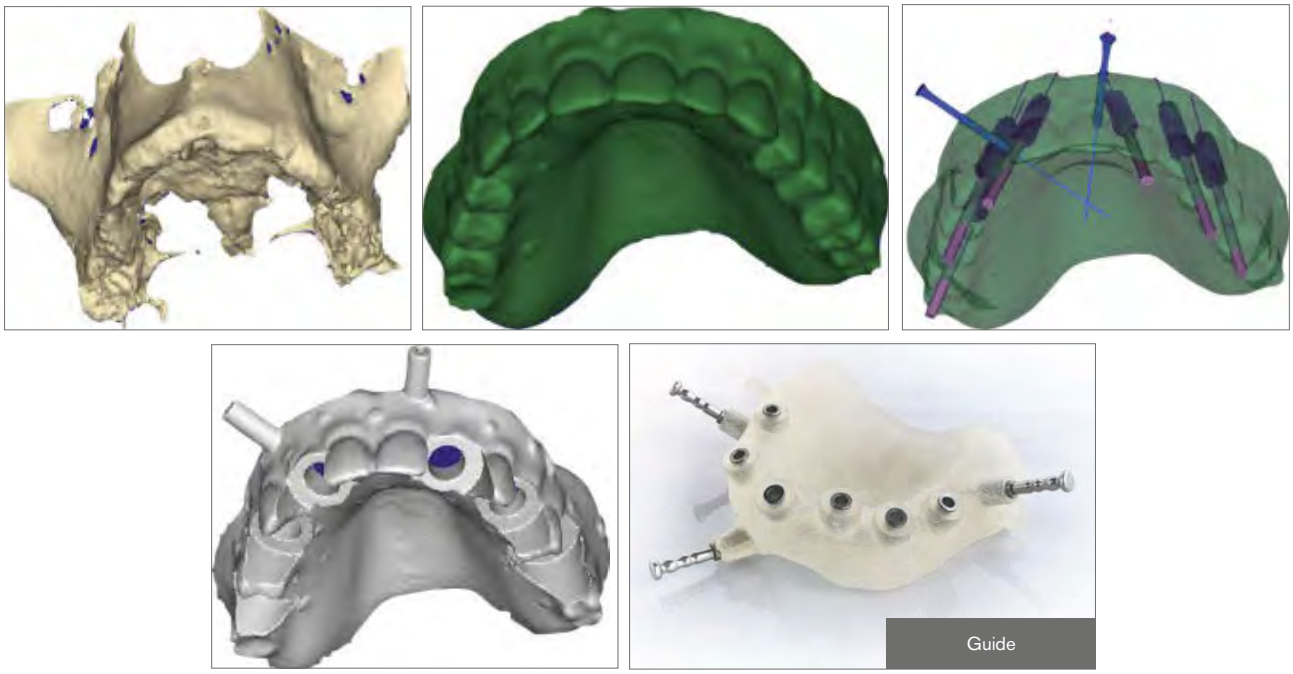
We have taken great care in the design and production of our products. However, we reserve the right to bring modifi cations or improvements arising from new technical developments in our implantology system.We will advise of any modifi cations having an implication in the operation mode. According to the importance of the modifi cations, a new manual will be issued. Indeed, a mark on the back page indicates the date of issue of your surgery manual, and enables us to check if you have the latest up date version. You will also be able to access our web site to check the latest version of this manual.
The reproduction and distribution of all or part of this manual need previous agreement from **euroteknika**.

General information
ON GUIDED SURGERY

Presentation OF THE CONCEPT

Guided Surgery (GS) can be defined as the possibility of transferring to a mouth an implant plan produced on a computer using data from the tomodensitometric examination (scanner, Cone Beam).
The transition from a virtual project to a surgical reality is possible thanks to a surgical guide developed by stereolithography using the data of the prosthetic intrados and the implant plan produced with the **teknika3D** planning software.

The benefits of guided surgery are indisputable. It provides a solution for pre-implant anatomical investigation (better prior visibility of anatomical complications) and improves the safety of implant surgery. All the important decisions can be taken into account prior to surgery (choice of implant site, of the size and the diameter of the implant, etc.). Since only the first drilling Ø 2 is done, any implant type can be then placed by continuing the site preparation with the implant system used.



MAJOR INDICATIONS

It is a treatment concept applicable to all indications and offers a wide range of flexible solutions:

- A single tooth, partial dentition, or full dentition.
- Incisionless surgical procedure (flapless technique), with mini-flap, or with flap.
- Immediate treatment or deferred treatment.
- A prefabricated prosthetic or a conventional one.

Note that all the following criteria must be met:

- The patient meets all the necessary health requirements for surgical intervention.
- Healing is total after a graft procedure.
- Bone quantity and quality is satisfactory.
- The mouth opening is large enough and suitable for the surgical instruments.

Advantages and benefits OF GUIDED SURGERY

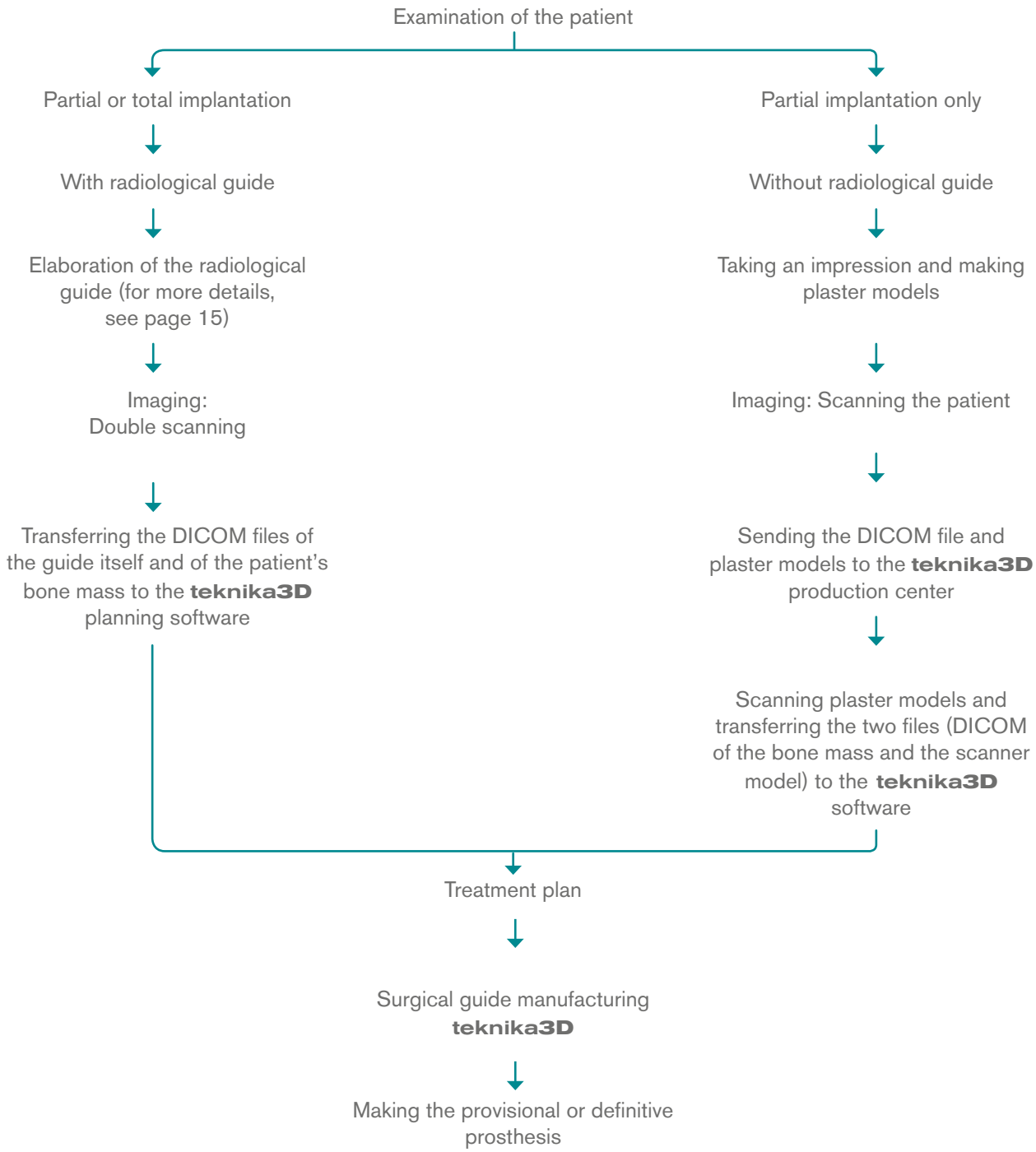
- It helps you decide on an implant treatment with the ability to preview the results, as the system is very reliable, allowing optimal positioning of implants with no margin for error.
- Analysis of bone density: this presents surgical and prosthetic choices: the surgical sequence, the number of implants, their positions, their Angolaziones, their prosthesis type, etc.
- Maximum use of bone volume: no more timid implantations.
- Calculate the volumes to be grafted, choose the donor site.
- Orient the implant precisely mesiodistally and vestibulolingually.
- Simplify protocols, and increase the surgical treatment success rate.
- Control bone grafts, and even in some cases reduce graft indications by using the maximum remaining bone volume.
- Allow perilous or difficult implantations: research bicortical support, lateralization of implant vector compared to the dental nerve...
- Eliminate an extra step by using flapless surgery, greatly improving surgical outcomes, saving time, and making the procedure much more comfortable for the patient.
- Combine the osseointegration period and post-extraction implantation to achieve the least bone resorption and maximum precision.
- Improve patient-practitioner communication.
- This system greatly contributes to better coordination between the members of the treating team (practitioner, prosthetist, lab, assistants) as it has the advantage of being an excellent communication and therefore work tool for the group.
- The distance between implants or between implant / tooth is reduced and non compatible with classic guided surgery guides.
- You can place any type of implant after finishing the bone preparation with a classic surgery system.

Limits OF SIMPLIFIED GUIDED SURGERY

These are mainly technical:

- The mouth opening must be large enough and suitable for the surgical instruments.
- The anatomy of the site does not make it difficult to position and anchor the implant.
- There must be sufficient bone depth.
- The bone characteristics must be suitable (guided surgery requires adequate bone quantity and quality).
- Hygiene: the patient must be informed, willing and be able to offer good post-procedure care. Uncooperative patients should be discarded.
- It is important to emphasize that mucous surgery is extremely demanding in terms of indications. These guides are very precise, but are not absolute and should not detract from ensuring adequate surgical leeway.

Process OF GUIDED SURGERY


Examination of the patient
Partial or total implantation
With radiological guide
Elaboration of the radiological guide (for more details, see page 15)
Imaging: Double scanning
Transferring the DICOM files of the guide itself and of the patient's bone mass to the teknika3D planning software
Partial implantation only
Without radiological guide
Taking an impression and making plaster models
Imaging: Scanning the patient
Sending the DICOM file and plaster models to the teknika3D production center
Scanning plaster models and transferring the two files (DICOM of the bone mass and the scanner model) to the teknika3D software
Treatment plan
Surgical guide manufacturing teknika3D
Making the provisional or definitive prosthesis

PRE-IMPLANT
STUDY

Clinical-radiological EXAMINATIONS

Successful guided surgery requires substantial prior clinical and implant experience.
The diagnosis must be minutely precise as many factors need to be taken into consideration for the therapy to work:

Patient profile

➤ General condition

Many important factors must be taken into account when assessing a patient before any implant surgery. A detailed study of the patients' general state of health, their clinical history, their oral hygiene, their motivation and their expectations are an integral part of the pre-operative assessment. It is recommended that a physician be consulted if the patient's clinical history reveals a pre-existing condition or a potential problem that may compromise their treatment and/or well-being.

➤ Cooperation

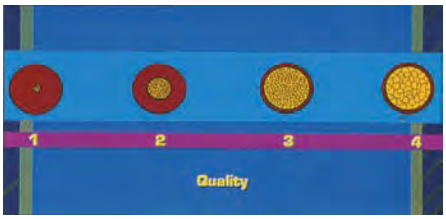
This is necessary during the treatment as strict hygiene is rigorously necessary. To obtain the patient's cooperation, motivation is essential. The practitioner must inform, motivate and teach their patient how to brush and to use each of the personally adapted instruments.

Intra-oral examination

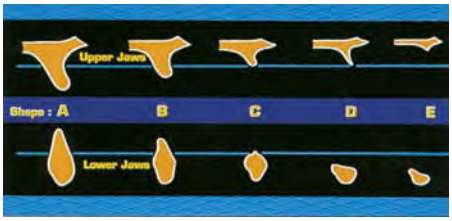
➤ Bone quality and quantity

The practitioner must determine whether the patient has an acceptable basic anatomy favorable to inserting an implant. The patient must have sufficient bone volume qualitatively and quantitatively. Primary stability is easily obtained with the preservation of cortical bone and minimal bone loss. Most authors report the best success with type I to III bone (Lekholm and Zarb classification) rather than type IV bone.

The classification of osseous structures*



1: very high density of compact bone
2: thick layer of cortical bone around a dense core of spongious tissue
3: thin layer of cortical bone around a big core of spongious tissue
4: thin layer of cortical bone around a big core of low density of spongious tissue



A: important quality of remaining alveolar bone
B: limited resorption of the alveolar bone crest
C: important resorption of the alveolar bone crest
D: beginning of the basal resorption bone
E: important resorption of the basal bone

** Misch, (1998) Lekholm and Zarb (1985), Classification of partially edentulous arches for implant dentistry.*

Some areas must be avoided, in particular when immediate treatment is undertaken as they have a low proportion of trabecular bone. It is therefore more difficult to obtain good primary fixation in these zones. For example, in front of the sinuses in the premaxillary, the bone is type II or III, while behind, in the tuberosity, the bone is often type IV. The surgical procedure must therefore need to be adapted to these low-density zones: under-drilling and search for bi-cortical anchorages.

Furthermore, if a bone fault is present in the cortical bone or if there is a major fault in the trabecular bone, the GS as well as the immediate treatment of the implant can become complicated. This could also contraindicate the insertion of the implant with bone regeneration at the same time.

➤ In the vestibulo-lingual sense:

If possible, leave 2x1mm of bone thickness (a vestibular and ligual bone wall of 1mm around the implant).
- When implants need to be placed in an esthetic sector, the thickness of the vestibular wall must be greater than or equal to 2mm.

➤ In the corono-apical sense:

- In the maxilla: the crestal height necessary is equal to the length of the implant, a penetration of 1 to 2mm in the sinus is tolerated (Nadir et al. 2004)
- In the mandible: the height necessary is equal to the length of the implant + 2.5mm.
- Note that bone density is a determining factor in selecting the implant. We recommend using the largest implants in low-density bone in order to compensate for the loss of bone/implant surface contact due to the cavities.

➤ In the mesio-distal sense:

- Ensure 1.5 to 2mm between the external surface of the implant and the adjacent teeth,
- Ensure 3mm between the external surfaces of two adjacent implants.

		Minimum recommended buried length
Bone quality	D1	8 mm
	D2	10 - 12 mm
	D3	12 - 14 mm
	D4	14 mm

Sufficient quantity of keratinized tissue

In the case of deficit at the implant site, a prior arrangement or flap procedure will be necessary to an apical displacement of tissue.

Presence or not of infection

Caution is rigorously required. Healing must be total after a graft procedure, extraction or curettage of an infectious site (curettage of the rest of the periodontal ligament, of a periodontal or periapical infection or granuloma) must be done before the treatment to avoid persistence of residual infection.

An implant treatment cannot be started before complete cleaning of all infectious sites.

(Active) infected sites constitute a contraindication to immediate treatment (De Kok 2006).

Healing potential

It is conditioned by some general diseases such as:

- Osteoporosis
- Phosphocalcic disorders
- Diabetes
- Hyperparathyroidism
- Patients who have undergone radiotherapy
- Weakened immune system
- Patients who smoke more than ten cigarettes a day...

In these patients, the bone quality and/or healing quality is mediocre.

TMJ, mouth opening and occlusion

The insertion of implants, in particular posterior, requires a sufficiently large mouth opening suitable for the surgical instruments, a 4 to 6cm opening.
Some TMJ disorders limit the mouth opening and can contraindicate implant insertion. In this respect, condyle travel and opening and closing movements of the mouth must be assessed.

The clinical examination must also determine the presence or not of occlusal anomalies or parafunctional habits, such as bruxism or crossbite. If that is the case, a treatment must be included in the overall treatment plan. The reversibility of the disorder must be determined before inserting implants.

Preparation OF THE RADIOLOGICAL GUIDE

The imaging guide is indispensable when computer aided implantology (CAI) is used for the guided positioning of implants. It identifies the thickness of the mucous tissue, the edentulous space and/or the teeth, and the ideal implant emergence profile.

Two situations are possible:

Full set of implants

The imaging guide can be prepared with the existing removable prosthesis, in which case it is necessary to verify that the initial prosthesis fits properly in order to guarantee perfect stability of the surgical guide.

Partial dentition or single tooth

The patient is not wearing a removable prosthesis, therefore two possibilities:

- Ask your laboratory to make a radiological guide. In this case, if the patient is wearing a restoration with metal material in the antagonist jaw, there is a higher risk of artefacts (false signals). To reduce this risk, a patient with partial dentition should be asked to keep their mouth half-open during radiography. The placement of the radiological guide must be accurate. That can be obtained by close adaptation against the remaining teeth. Some suggest using a check-bite over the salivary glands but the risk of shifting cannot be totally excluded.

- Plaster models of the patient's arches are prepared and scanned. In this case the plaster model is superposed on the patient's skeleton by aligning the remaining teeth using the **teknika3D** software.
This solution is less accurate.

The model should be intact. Repaired models, or models with broken teeth or mucosa region, models with air bubbles in the teeth or the mucosa region or with engraving done in laboratory are unusable.

Remove from the model the fixing pieces to the articulator. Make sure the plaster cast model comes with a support in order to avoid any break during transportation or handling.

Size: use a plaster cast model of the full jaw. The model should be large enough, as no implant is planned out of the model..

Precise details: all the teeth should be on the plaster cast model. Do not remove teeth that will be extracted during the surgery. Mark with a cross the teeth that will be extracted. The maxillary model should include the full palate and the tuberosity for a good stability.

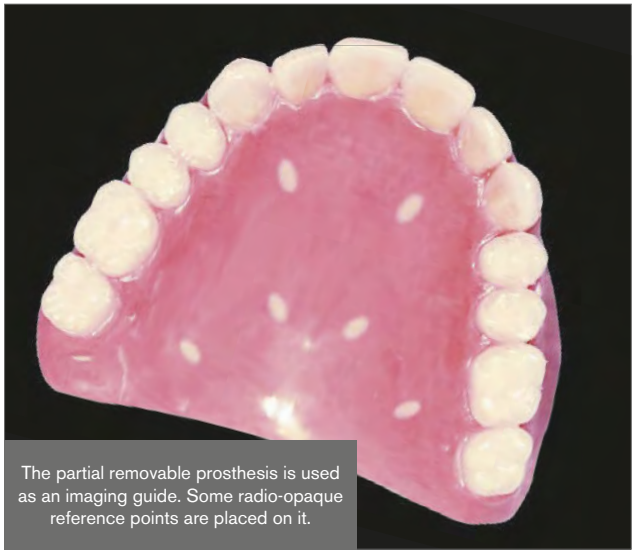
Send a recent plaster cast – not dating from more than a month – in order to avoid any adaptation problem due to a possible alteration of bone structures and teeth position.

Radiological guide manufacturing

Six to eight orifices about 1mm in diameter and 1mm deep (maximum) are made in the extrados of the prosthesis (or copy of the removable prosthesis) then filled with radio-opaque material (Gutta Percha for example). These references do not need to be aligned and are distributed over the entire extrados at various levels. There is no rule for where they should be placed.

However, in the case of partial or single tooth implantation, where there are existing metal fillings, the reference points should not be near fillings.

➤ The radio-opaque references allow the two acquisitions to be superposed, which is essential for a surgical guide.



The partial removable prosthesis is used as an imaging guide. Some radio-opaque reference points are placed on it.

In the maxilla

In the mandible

Technical aspect

It is recommended to do several openings where the imaging guide leans on the teeth. These openings allow to see the guide is properly seated in the mouth. They will be copied on the surgical guide thanks to the precision of the stereolytographic process, and will so allow to control the guide is properly seated during the operation.

Tomodensitometric EXAMINATION (CBCT scanner)

Double-scanning technique

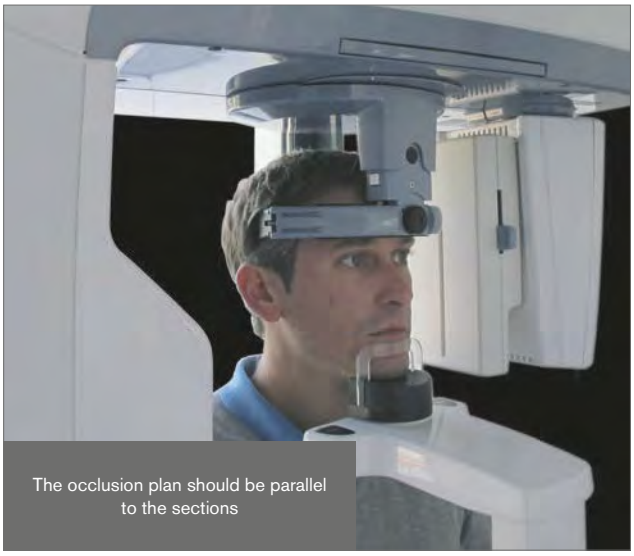
Once the prosthesis is transformed into a radiological guide, the patient is scanned with the guide in the mouth. Then only the radiological guide. The image is acquired at **euroteknika** using Cone Beam technology (Instrumentarium).

During the radiography, if the radiological guide is not in the originally intended position, the information transmitted to the implant planning software will be wrong and the implants will be placed in the wrong position. The stability of the radiological guide is even more important for a full-set procedure as the prosthesis must be maintained in perfect occlusion.

Double scan TECHNIQUE

SCAN 1 : scan the patient wearing the radiographic guide

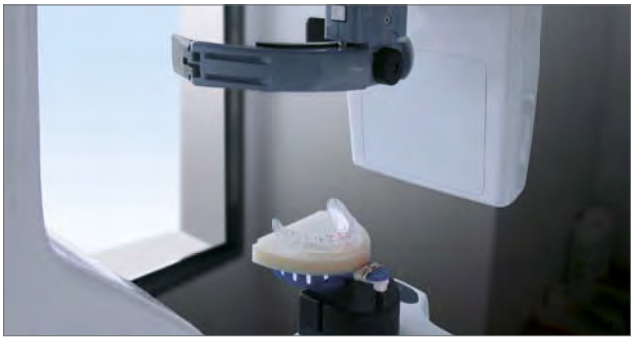
For optimal results, please observe the following:
- Check the radiologic guide is perfectly stable: it should be seated in the mandible or maxilla without interstice.
- Scan the mandible with a bite key.
- Remove any unfixed metal part (from removable prosthesis for instance).
- The teeth of the maxilla or mandible should not be in contact with the references points of the radiologic guide.



The occlusion plan should be parallel to the sections

SCAN 2 : a scan of the prosthesis

- Make sure the prosthesis is scanned in a position similar to the one of the scan 1
- Verify the prosthesis is supported by a highly translucent material.



Scanning parameters

Section width	Max. 1.0 mm	Ideally between 0,3 and 0.6 mm

Imaging TREATMENT

DICOM file import

The DICOM files are imported and converted into **teknika3D** software. **teknika3D** offers simultaneously an axial, sagittal, panoramic view and a 3d reconstruction. On each view, it is possible to access all and each of the plans successively piled up.

Implant planning OF THE CASE (treatment plan) with **teknika3D** software

Requirements to planning allow to exploit the patient's bone volume to position optimally the implants.

Before placing the first implant, you should identify the different anatomical constraints.

Indeed, the doctor can examine the bone volumes in the mandible or maxilla, identify and locate the anatomical elements such as the mental foramen, the dental nerve or the anterior incisive in the mandible, the nasal cavities or the sinus in the maxilla. He can also determine the healing level after an extraction.

A treatment planning is then realized in **teknika3D** software.
This planning should include the selected implant type, length, diameters and positions of the implants. The number of implants is a key factor for the long-term success of the implant-supported restoration.

Once the implant positioning is validated, and according to the case to be treated, fixing pins are placed; they are sometimes indispensable to stabilize the surgical guide during the operation.

Make sure there is no interference between the different elements (fixing pins and implants) or between these elements and the anatomic obstacles (nerve, sinus…)

Once the planning is validated and saved, the next step consists in viewing the future surgical guide. **teknika3D** software offers 3 choices : tooth, mucosa or bone support.

Only the **teknika3D** *software offers the possibility to create, once the planning validated, a surgical guide manufactured in our production center in Sallanches (74-France). For full guided surgery, only* **euroteknika** *implants are available with this software.*

SURGERY
GUIDE

Guide MANUFACTURING

Sending an implant project

Once your treatment plan has been prepared, send it to our **teknika3D** production center. When the surgical guide is on a dental base, the plaster model must be sent with the treatment plan.

As the teeth are non-deformable, the surgical guide that sits on top cannot be approximate and must be as accurate as possible. When the base is mucous, the double-scan technique does not require plaster models.

Surgical guide manufacturing

Any modifications can be done by **teknika3D** in collaboration with the practitioner. The practitioner approves the treatment plan in writing. The surgical guide is then fabricated using the stereolithographic process in our production center in Sallanches (74 – France). This is a highly accurate fast prototyping technique.

Receiving the surgical guide

It takes about 10 days between the simulation being sent via internet, validation by our **teknika3D** team, and the surgical guide being received (see the table of the steps involved in the treatment).
It is necessary to incorporate this length of time into the planning of any intervention. Practitioners who are used to treating patients for whom treatment time is critical or in an emergency must take the time to explain to them the benefits of guided surgery in terms of effectiveness, accuracy and reduced post-operative complications.

Verification of the surgical guide fit in the mouth

Once received, the surgical guide should be tried in the mouth to ensure its conformity. It can happen that the guide is not properly adapted, that it wobbles, in which case it must be redone. There is thus a risk of the surgery being postponed if the timing is too tight.

Surgical procedure

For more details about the surgical procedure, see pages 26 to 32 (step-by-step operative procedure).

Important information ABOUT THE SURGICAL GUIDE

The customized surgical guide produced by stereolithography is now what we could call the missing link in classic implant treatments as well as for other techniques in development (robotization, magnetic navigators and infrared drill positioning).

Guide manufacturing process

Manufacturing machine

Guide at the exit from the machine

Cleaning of the guide

Guide after cleaning

Setting up of the titanium guiding rings

Composition and storage of the surgical guide

It is composed of a material (resin) that is sensitive to light (ultraviolet rays), to temperature and to humidity. We therefore recommend:

- The surgical guide should be stored with a humidity absorbant (never take it out as it runs the risk of altering its dimensional stability). It must be kept in the protective packaging in which it was delivered until as close as possible to the time of surgical intervention.
- Store the surgical guide in a dry place away from light (in particular away from direct sunlight) at room temperature (10-30°C).
- Never expose the guide to liquids (water or other) for more than 30 minutes as there is a high risk of deformation.

Disinfecting the surgical guide

The surgical guide is not sterilizable by autoclave, only disinfection is possible. Soak the guide in chlorohexidine for maximum 20 mins, then dry it quickly without using a heat source.

Types of **euro**teknika surgical guides

The surgical guide is made to measure for each case to ensure optimal fit, regardless whether it is supported by bone, mucosa or teeth.

➤ **Guide supported by teeth:** This is indicated for partial implantation. It is simpler to use and put in place. This is particularly useful when filling gaps. When the dentition is terminal, the guide has an anterior dental support but not posterior. This zone is less stable, in which case the anchoring wedges are used to ensure better guide stability.

➤ **Guide supported by mucosa:** This type of guide is required in the case of total or partial absence of teeth or a 30mm toothless zone, its advantage over a bone-borne guide is that it avoids flap surgery.
The guide rests on mucous membrane, an excellently deformable surface, and to ensure better guide stability anchoring wedges are used. However, these wedges must be inserted carefully and particular care must be taken not to generate asymmetric forces that can shift the guides in one direction or another.

The best way to avoid errors of this type during this step is to use the rigid occlusion positioning key. Obviously, the surgical guide should be positioned under the same conditions as the radiological guide during the acquisition so as to obtain the equivalent deformation of the mucosa.

➤ **Guide supported by bone:** This is indicated when a flap needs to be created. This is the case when the surgeon wants to visualize the position in the presence of a narrow crest or in the case of total lack of teeth in a terminal zone. The supporting bone is not deformable. However, it is preferable to immobilize it with anchoring wedges. The remarks about guide wedges for mucous support also apply to bone-borne guides.

Customized guides for the entire process

Surgical guides are used to guide the gum incision (for the flapless technique), the drilling and the positioning of the implant thanks to special instruments and dedicated implants.
Surgical guides can also be used to fabricate a provisional prosthesis, thereby reducing the waiting time traditionally required to meet patients' esthetic and functional demands.

Order process of the **euro**teknika surgical guides

➤ **Step 1 :** Sending the files coming from our **teknika3D** software to our server

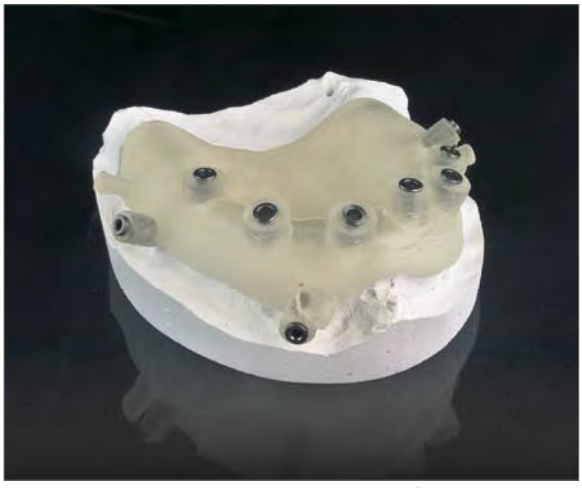
➤ **Step 2 :** Processing of the received files to design the surgical guide

➤ **Step 3 :** Validation of possible modifications carried out by **teknika3D** and the dentist

➤ **Step 4 :** Confirmation of the planning

➤ **Step 5 :** Manufacturing of the guide by **teknika3D**

➤ **Step 6 :** Sending the guide with the implants and the printed treatment planning as a support



SURGERY

The surgical KIT

The stake for the realization of the implant socket is on two levels:

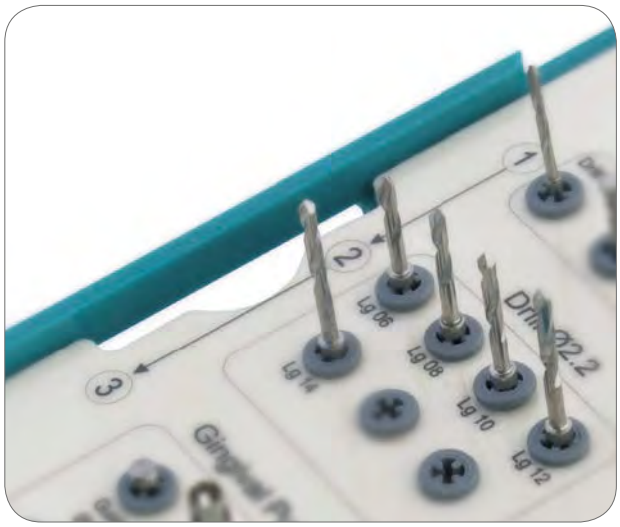
- The preparation through the guide of the first drilling Ø 2.2 gives the axis and the insertion depth of the implant.
- Minimum overheating to avoid all irreversible bone necrosis. The socket preparation will be made under constant external irrigation with sodium chloride at 0.9%. The critical temperature threshold is 47°C for 1mn. At 50°C the necrosis is irreversible.

The obtainment of a calibrated socket assuring a good airtightness.

The instruments are sorted by their stage of use as shown by arrows on the kit. Numbers notify the main stops of each stage.

WARNING

The minimum heating will be achieved with irrigation and with a proper selection of drills with a good cutting
power. It is therefore necessary to check the number of use of the drills involved in the implant socket preparation.
Use the cursors in the surgical kit and change your drills after 10 uses.



This kit contains all the instruments necessary to the guide fixing, the first drilling Ø 2.2 and the gingival punch.

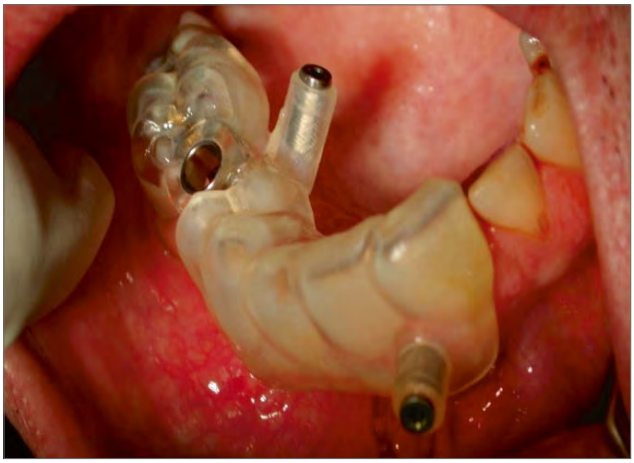
Placement OF TITANIUM SLEEVES

The position of the titanium sleeves on the surgical guide is fixe. The top of the sleeve is 10 mm above of the implant neck.

Flapless TECHNIQUE

1- Verification of the stability of the surgical guide

Once received, the surgical guide should be tried in the mouth to ensure its conformity. It can happen that the guide is not properly adapted, that it wobbles, in which case it must be redone. The surgery must therefore be postponed.



2- Disinfection of the surgical guide

The surgical guide is not sterilizable by autoclave, only disinfection is possible. Soak the guide in the chlorohexidine for maximum 20 mins, then put it in the mouth rapidly.

3- Local anesthesia

Injections of anesthetics must be **away from the guide support zone**. The anesthesia step is a source of mis-positioning in relation to the intended project. The injection of local anesthetic creates mucous swelling which is sometimes hardly perceptible but which can hinder the insertion of the dental or mucosa-borne guide, or favor incorrect positioning, which can induce great instability of the guide, in particular the mucosa-borne guide.

Analgesic techniques must be mastered to ensure correct and painless guided surgery. This problem does not occur with the bone-borne guide as the flap is created after the anesthesia step.

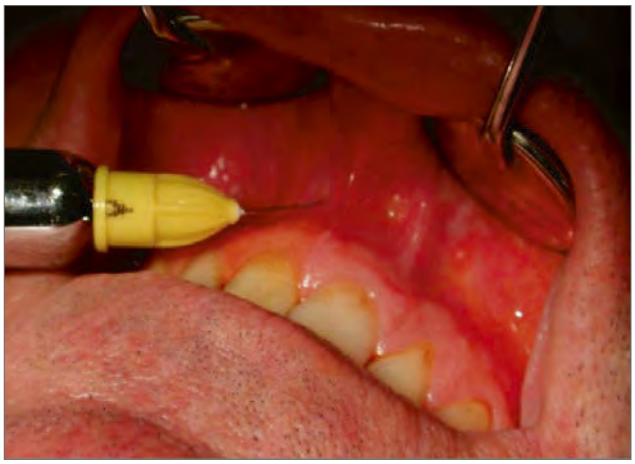
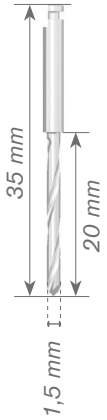
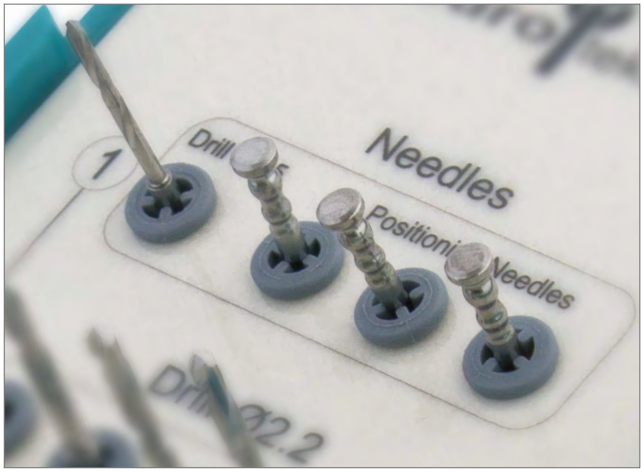


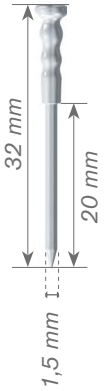
Photo credit : Dr Ella Bruno (33)

4- Stabilization of the surgical guide

The guide is stabilized by placing three anchoring needles, after preparing the sites for them with the Ø1.5 drill at 1,000 rpm.







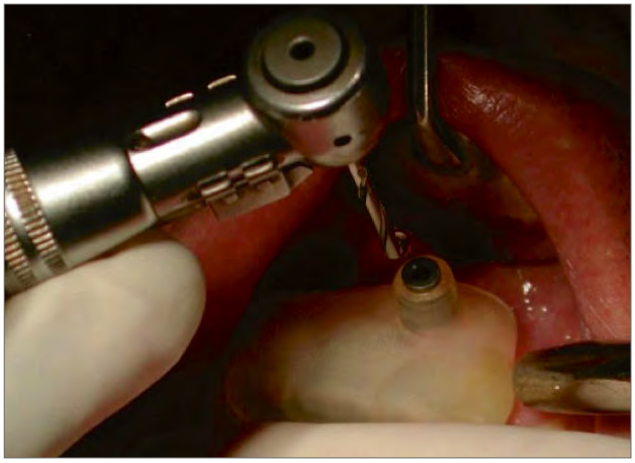
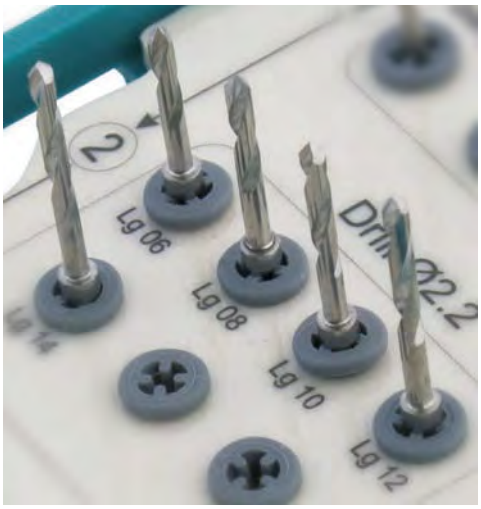
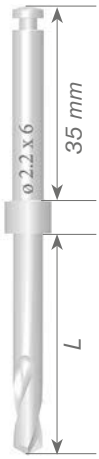


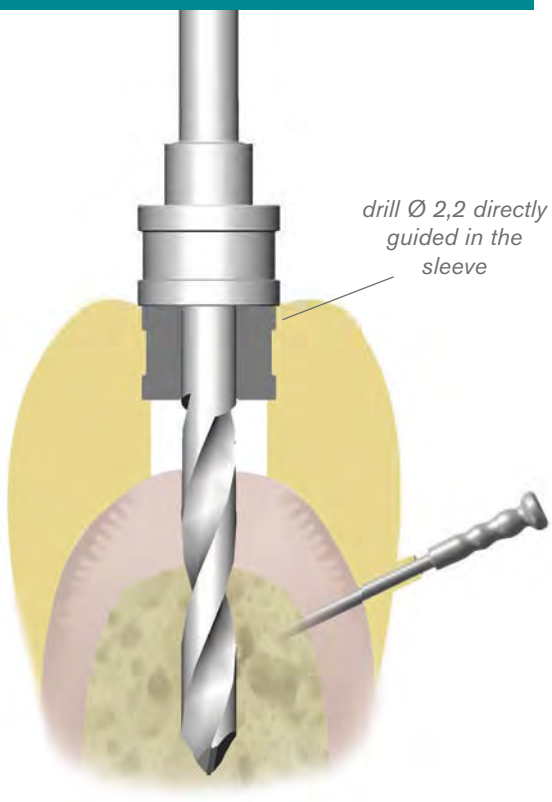
Photo credit : Dr Ella Bruno (33)

5- Initial drilling through the guide

Choice of the length of the Ø 2.2 mm drill The preparatory drilling is to determine the axis and the depth of implant sockets.

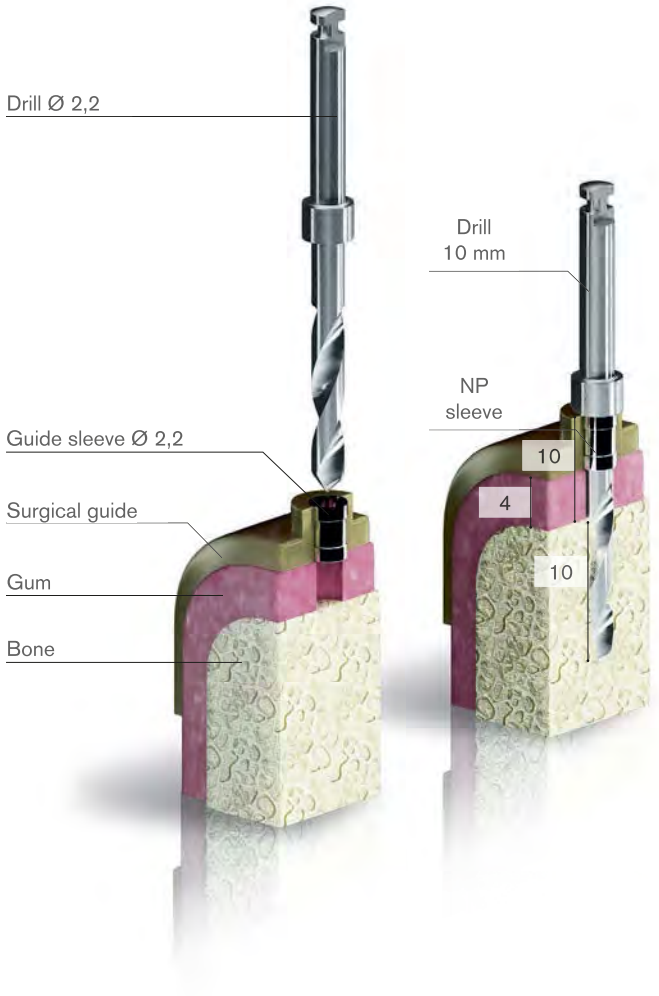






The Ø2.2 drills have stops, and come in five different lengths: 6-8-10-12-14 mm.

Drill until the fixed stop, under constant irrigation with sodium chloride, at a speed of 1000 rpm. Do not force the drill. If it binds it indicates that bone debris is not exiting up the flutes. A carefully controlled simple back-&-forth movement creates easy drilling. Doing this at the right moment avoids needing to reverse the motor. If the drill is stuck, it can be released by using “reverse” mode.
It is also important to make back-&-forth movements to keep the drill tip cool inside the guide.

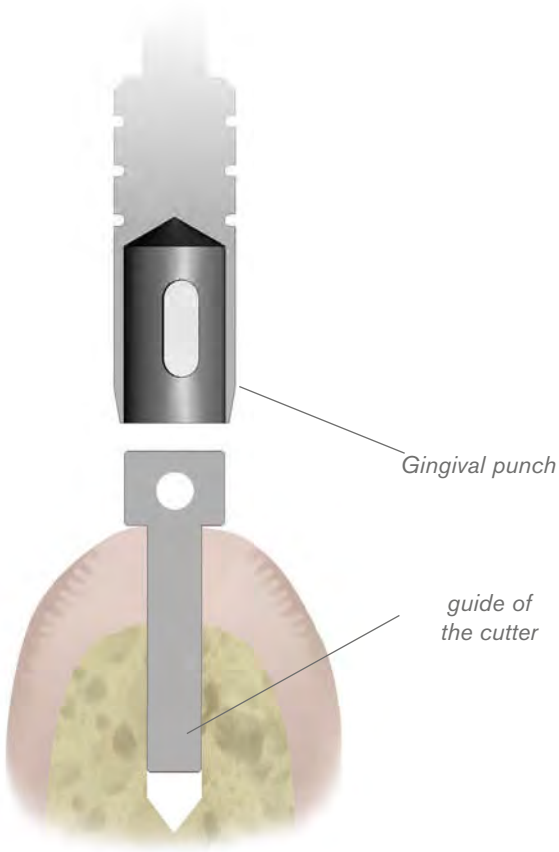


When drilling, check that the bone is bleeding. If it is not, scrape the bone a bit to make it bleed with a probe or a curette which can pass through the guide sheath without compromising the stability of the surgical guide.
In the absence of blood flow, it is preferable to close and wait for blood flow.

For example, on a implant 10mm long following the gum height

6- Removal of the guide

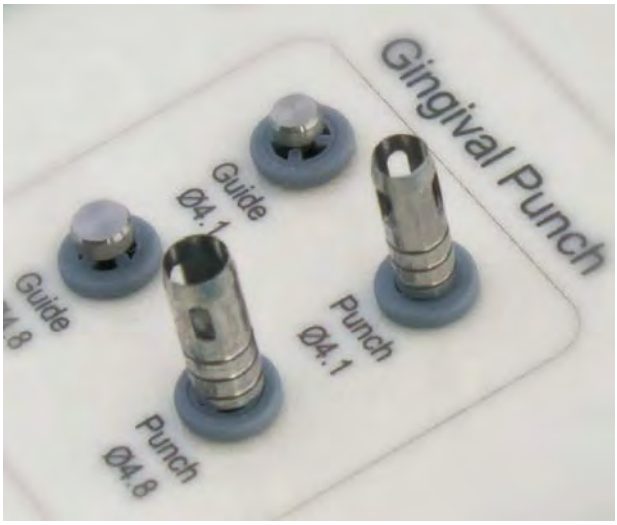
At the end of the intervention, the guide is removed and any excess mucous tissue that may hamper the insertion of the prosthesis is removed.

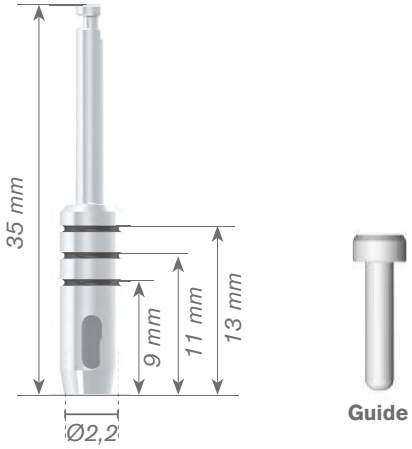


7- Removal of soft tissue

Setting of the gingival punch guiding tool, and passing the gingival punch.

Set the motor speed at 400 rpm with irrigation.
The implant site soft tissue is removed with the gingival punch.





8- Preparation of the implant sites and implant placement

Continue the implant site preparation with the traditional surgery kit of the used system.

9- Osseointegration

The conventional period to obtain a good osseointegration is:
- 3 months in the mandibular,
- 6 months in the maxilla due to a softer bone

The dentist should define this period by taking into account the bone quality, the implant primary stability and the prosthetic plan.
In certain cases, the dentist can decide to connect the prosthetic parts without waiting for the osseointegration. However, the dentist must be able to analyze if the conditions of the clinical case are appropriate to an immediate loading.

Studies and scientifi c datas indicate that immediate loading has proven to be successful at the mandibular when the prosthesis is built on 4 implants or more linked
together. Immediate loading is not recommended on single

The drilling sequence that we propose is a standard sequence that must be adapted to suit the patient's bone quality (density) and implant site.

In case of failure

To remove an implant, use a trephine with a greater diameter than the placed implant and remove the bone cylinder obtained. Implant removal is facilitated by using an implant-holder screwed on the implant.
The socket can possibly be re-implanted:
- if the patient is fit to receive a new implant,
- with an implant of wider diameter, in the case that the

To put another implant with a smaller diameter, it is better to wait for the complete healing of the socket.

It is important to analyse the reasons of the failure before placing a new implant.
The doctor decides whether it is necessary to use bone material to fill in the socket.

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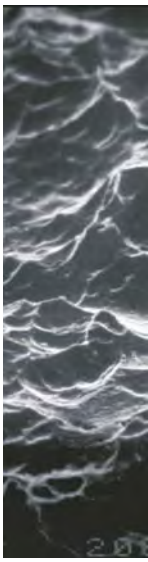

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